

# VU Research Portal

## Lower limb muscle endurance and muscle strength in children and adolescents with cerebral palsy

Eken, M.M.

2017

### **document version**

Publisher's PDF, also known as Version of record

[Link to publication in VU Research Portal](#)

### **citation for published version (APA)**

Eken, M. M. (2017). *Lower limb muscle endurance and muscle strength in children and adolescents with cerebral palsy*. [PhD-Thesis - Research and graduation internal, Vrije Universiteit Amsterdam].

### **General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

### **Take down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

### **E-mail address:**

[vuresearchportal.ub@vu.nl](mailto:vuresearchportal.ub@vu.nl)



Children and adolescents with cerebral palsy often have problems in performing activities of daily life, like walking. This might be due to a loss of muscle function, which is commonly assessed as the strength from a single maximal contraction. However, most activities of daily life involve a series of repetitive submaximal contractions. This thesis reports on the ability of children and adolescents with cerebral palsy to perform such series of repetitive contractions, referred to as lower limb muscle endurance. The results of this thesis show that lower limb muscle endurance is considerably reduced in children and adolescents with cerebral palsy and relates to limitations in daily activities and self-reported fatigue, indicating the clinical impact of reduced muscle endurance in this population. Results show that both a laboratory-based repetitions-to-fatigue protocol as well as a field-based squat test can be used to measure lower limb muscle endurance of children and adolescents with cerebral palsy in a clinically meaningful way. This thesis also shows that lower limb muscle endurance of individuals with cerebral palsy is closely related to their maximal muscle strength. Based on this thesis it is advised to consider training of lower limb muscle endurance and strength in the rehabilitation program of children and adolescents with cerebral palsy, which can enhance their mobility and reduce fatigue.

# Lower limb muscle endurance and muscle strength in children and adolescents with cerebral palsy

Maaïke M Eken

## inspired by motion

Freedom of movement in all its aspects determines quality of life – from cell to organ and from organ to the entire body. Our inspiration is substantiated through research into regenerative medicine, rehabilitation and sport.

founded by VU University Amsterdam, VU University Medical Center Amsterdam and the Academic Centre for Dentistry Amsterdam (ACTA)  
[www.move.vu.nl](http://www.move.vu.nl)

**move** research  
institute  
amsterdam

move  
research  
institute  
amsterdam

Lower limb muscle endurance and muscle strength in children and adolescents with cerebral palsy

Maaïke M Eken